

Title: Simultaneous Multi-User Document Editing System

Abstract

A system and methods for simultaneous editing of one or more documents by two or more distinct users is disclosed. Each document is divided into a number of mutually exclusive sections, which together contain the entire document. Each section is stored in a separate data container. Each document has primary data of a primary data type. The containers that store the primary data for each document have a common parent container, which is at the head of a document sub-tree corresponding to the document. A document may also include embedded data, which may be of the same or a different type than the primary data. The embedded data is typically stored in embedded data containers, which are typically child containers of the primary data containers. Each of the parent containers is a child container of a root container, which is at the head of a container tree in which all documents in a workspace are stored. Each workspace also includes a member list. The system may include more than one workspace, and may include users who are members of more than one workspace. Editors are provided for editing documents and embedded data of a number of data types that are supported by the system. Each editor is configured to allow a member to edit data in a section of a document. Typically, data may only be edited after obtaining an exclusive lock for the container in which the section is stored. However, in some cases, data may be edited without first locking the associated container and the modified container may be blindly posted. Different sections of a document may be simultaneously locked by different members, allowing the members to simultaneously edit the two different sections. Editing changes to a document are posted by each editor to a workspace server, which then broadcasts the changes to all connected members of the workspace, allowing members to view changes to a document after they are posted.